

SCOPE OF CLAIMS

1. A mobile terminal positioning system for positioning a mobile radio terminal apparatus by detecting the arrival time of a signal between a radio base station apparatus and the mobile radio terminal apparatus, said radio base station apparatus comprising:

5 estimating means for calculating reception SIRs (Signal to Interference power Ratios) for respective subcarriers with respect to a received signal from said mobile radio terminal apparatus;

 averaging means for averaging the SIRs calculated for the respective subcarriers by said estimating means;

10 threshold value setting means for setting a threshold value for a path search based on an SIR calculated by said averaging means;

 first path detecting means for conducting said path search based on the threshold value set by said threshold value setting means, to detect a first path; and

15 arrival time calculating means for calculating said arrival time based on the first path detected by said first path detecting means.

2. The mobile terminal positioning system according to claim 1, wherein said threshold value setting means sets said threshold value to a higher value when said SIR is higher and sets said threshold value to a lower value when said SIR is lower.

3. The mobile terminal positioning system according to claim 1, wherein said radio base station apparatus further comprises:

 pilot demodulating means for demodulating a pilot signal based on the received signal from said mobile radio terminal apparatus;

5 wherein said estimating means estimate said SIRs based on a desired wave reception level and an interference wave reception level for a digital signal obtained from said pilot demodulating means.

4. The mobile terminal positioning system according to claim 1, wherein either one of at least OFDM (Orthogonal Frequency Division Multiplexing) and MC-CDMA (Multi-Carrier - Code Division Multiple Access) is employed as a multi-carrier transmission process.

5. The mobile terminal positioning system according to claim 1, wherein at least a W-CMDA (Wideband - Code Division Multiple Access) modulation process is employed.

6. A radio base station apparatus for positioning a mobile radio terminal apparatus by detecting the arrival time of a signal between the radio base station apparatus and the mobile radio terminal apparatus, comprising:

5 estimating means for calculating reception SIRs (Signal to Interference power Ratios) for respective subcarriers with respect to a received signal from said mobile radio terminal apparatus;

 averaging means for averaging the SIRs calculated for the respective subcarriers by said estimating means;

10 threshold value setting means for setting a threshold value for a path search based on an SIR calculated by said averaging means;

 first path detecting means for conducting said path search based on the threshold value set by said threshold value setting means, to detect a first path; and

15 arrival time calculating means for calculating said arrival time based on the first path detected by said first path detecting means.

7. The radio base station apparatus according to claim 6, wherein said threshold value setting means sets said threshold value to a

higher value when said SIR is higher and sets said threshold value to a lower value when said SIR is lower.

8. The radio base station apparatus according to claim 6, further comprising:

pilot demodulating means for demodulating a pilot signal based on the received signal from said mobile radio terminal apparatus;

5 wherein said estimating means estimate said SIRs based on a desired wave reception level and an interference wave reception level for a digital signal obtained from said pilot demodulating means.

9. The radio base station apparatus according to claim 6, wherein either one of at least OFDM (Orthogonal Frequency Division Multiplexing) and MC-CDMA (Multi-Carrier - Code Division Multiple Access) is employed as a multi-carrier transmission process.

10. The radio base station apparatus according to claim 6, wherein at least a W-CDMA (Wideband - Code Division Multiple Access) modulation process is employed.

11. A method of positioning a mobile radio terminal apparatus by detecting the arrival time of a signal between a radio base station apparatus and the mobile radio terminal apparatus, said method comprising, as performed by said radio base station apparatus, the steps of:

5 calculating reception SIRs (Signal to Interference power Ratios) for respective subcarriers with respect to a received signal from said mobile radio terminal apparatus;

averaging the SIRs calculated for the respective subcarriers; setting a threshold value for a path search based on an averaged SIR;

10 conducting said path search based on the set threshold value to detect a first path; and

calculating said arrival time based on the detected first path.

12. The method according to claim 11, wherein said step of setting a threshold value comprises the step of setting said threshold value to a higher value when said SIR is higher and sets said threshold value to a lower value when said SIR is lower.

13. The method according to claim 11, further comprising, as performed by said radio base station apparatus, the step of:

demodulating a pilot signal based on the received signal from said mobile radio terminal apparatus;

5 wherein said step of calculating reception SIRs comprises the step of estimating said SIRs based on a desired wave reception level and an interference wave reception level of said demodulated pilot signal.

14. The method according to claim 11, wherein said radio base station apparatus employs either one of at least OFDM (Orthogonal Frequency Division Multiplexing) and MC-CDMA (Multi-Carrier - Code Division Multiple Access) as a multi-carrier transmission process.

15. The method according to claim 11, wherein said radio base station apparatus employs at least a W-CMDA (Wideband - Code Division Multiple Access) modulation process.

16. A program for a method of positioning a mobile radio terminal apparatus by detecting the arrival time of a signal between a radio base station apparatus and the mobile radio terminal apparatus, said program enabling a computer to perform the steps of:

5 calculating reception SIRs (Signal to Interference power Ratios) for respective subcarriers with respect to a received signal from said mobile radio terminal apparatus;

averaging the SIRs calculated for the respective subcarriers;

10 setting a threshold value for a path search based on an averaged SIR;
 conducting said path search based on the set threshold value to detect a first path; and
 calculating said arrival time based on the detected first path.